9/13 - (C) EPODOC / EPO
PN - GB604813 A 00000000
AP - GBD604813 00000000
DT - O
EC - C22C21/10
AB - An aluminium base alloy has the following composition: Zn 3.00-10,00 per cent, Mg 1.00-5.00 per cent, Cu 1.10-5.50 per cent, Si 0.01-1.50 per cent, Fe 0.01-1.50 per cent, Ni 0-5.00 per cent, Mn 0-3.50 per cent, Al being the remainder but so that in the absence of Mn the Ni content exceeds 3.5 or in the absence of Ni the Mn content exceeds 2.0 per cent but if Mn and Ni are simultaneously present their combined content must exceed 4.0 per cent, the Mn proportion must exceed 0.38 per cent and the Cu and Mg must each be present in a proportion of 2.0 per cent or under. The alloy may contain one or more of the following elements each in the stated proportions, the total of these elements not exceeding 1.75 per cent. Sb up to 1.50 per cent, Sn up to 1.50 per cent, Ti up to 0.70 per cent, Nb up to 1.00 per cent, Ce up to 1.00 per cent, Co up to 1.75 per cent. The alloy may contain one or more of Be, B, Cr, Ta, Te, Tl, Th, W, V, Zr, Yt not exceeding 1.50 per cent in total, and one or more of Bi, Cd, As, Na, Ba and P not exceeding 0.50 per cent in total. The alloy is preferably used in the worked condition and it may be subjected to solution treatment, e.g., at 480 to 530 DEG C. for about 1/2 -4 hours followed by quenching in water or other medium, followed by natural ageing or artificial ageing, e.g. at about 100-170 DEG C. for about 2-24 hours.

Find rest of patent

PATENT SPECIFICATION

604,813

Application Date: Dec. 5, 1945. No. 32844/45.

Complete Specification Left: July 26, 1946.

Complete Specification Accepted: July 9, 1948.

Index at acceptance:—**Classes 72,** A4(a: b); **and 82(i),** A1(c: d: e), A8(a: b: c: d: e: f: g: h: i: j: k: m: n: o: q: r: t: u: v: w: y), A8z(2: 3; 4; 5: 10: 12: 14), A9a.

PROVISIONAL SPECIFICATION

A New Aluminium Base Alloy

I, TENNYSON FRASER BRADBURY, "The Uplands," 57, Windley Crescent, Darley Abbey, Derby, a British Subject, do hereby declare the nature of this invention to be as follows: —

This invention is for a new aluminium base alloy possessing outstanding hardness and tensile strength.

According to this invention the alloy is composed of the following elements, in the following percentages by weight.

Zinc	3.0 to 10.0 per cent.
Magnesium	1.0 to 5.0 per cent.
Copper	1.1 to 5.5 per cent.
Silicon	0.01 to 1.5 per cent.
Iron	0.01 to 1.5 per cent.
Nickel	0.0 to 5.0 per cent.
Manganese	0.0 to 3.5 per cent.
Aluminium	the remainder.

In the absence of manganese the nickel would be present in a quantity exceeding 3.5 per cent., but if manganese is present, the nickel can be reduced providing that the nickel and manganese together shall always exceed 4.0 per cent. In the absence of nickel, the manganese must always exceed 2.0 per cent.

The alloy need not, but may also contain one or more of the following elements,

Antimony	up to 1.5 per cent.
Tin	up to 1.5 per cent.
Titanium	up to 0.7 per cent.
Niobium	up to 1.0 per cent.
Cerium (added as commercial Cerium or as Mischmetal)	up to 1.0 per cent.
Cobalt	up to 2.0 per cent.

For general purposes these elements will not exceed a total of 1.75 per cent.

[*Price* 1/-]

Other elements, namely beryllium, boron, chromium, calcium, molybdenum, lead, lithium, silver, tantalum, tellurium, thallium, thorium, tungsten, vanadium, zirconium, and yttrium, whether present as grain refiners or as minor constituents should not exceed a total of 1.5 per cent.

Other elements like bismuth, cadmium, arsenic, sodium, barium, and phosphorus, which may be present in the metals or alloys used in the manufacture should not exceed a total of 0.5 per cent. in all.

The alloy is prepared in the usual manner, namely by adding to molten commercial aluminium, aluminium alloys rich in one or two of the elements to be added. Certain of the elements such as zinc, and magnesium may be added in the solid form to the melt containing the other elements.

The alloy may be heat-treated. The preferred form of heat-treatment is to soak the part at about 480 to 530 degrees centigrade for about half to four hours and quench in water or other media, followed by either natural ageing or artificially ageing at about 100 to 170 degrees centigrade for from about 2 to 24 hours.

Normally alloys of this type containing percentages of copper, zinc, and magnesium within the ranges specified would "burn" (that is, cause the liquation of a eutectic), if a temperature of about 480 degrees centigrade was exceeded, but by adjustments to the percentages of nickel and copper, it is possible to work and heat-treat at temperatures of over 500 degrees centigrade.

In the absence of nickel, the corrosion resistance in sea water is slightly improved, but the temperature when burn-